What is claimed is:

1. A peeling-off method of a resist film on an Si-C based film that has been formed on a substrate comprising:

a preparing step of preparing an organic solvent as a release agent, and

an applying step of applying the organic solvent to the resist film.

2. A peeling-off method of a resist film according to claim 1, wherein

the Si-C based film is a film having an antireflection function and a hard-mask function, and

the applying step is carried out without deteriorating the antireflection function and the hard-mask function of the Si-C based film.

3. A peeling-off method of a resist film according to claim 1 or 2, wherein

the organic solvent is a thinner.

4. A peeling-off method of a resist film according to claim 3, wherein

the organic solvent is an acetone-based thinner.

5. A peeling-off method of a resist film according to any of claims 1 to 4, wherein

the applying step is carried out by supplying the release agent onto the resist film with rotating the substrate.

6. A peeling-off method of a resist film according to any of claims 1 to 4, wherein

the applying step is carried out by dipping the substrate into the release agent.

7. A reworking method of a resist film comprising:

a peeling-off step of peeling-off a resist film on an Si-C based film that has been formed on a substrate, and

a reworking step of forming another resist film again on the Si-C based film,

wherein

the peeling-off step includes

a preparing step of preparing an organic solvent as a release agent, and

an applying step of applying the organic solvent to the resist film.

8. A reworking method of a resist film according to claim 7, wherein

the Si-C based film is a film having an antireflection function and a hard-mask function, and

the applying step is carried out without deteriorating the antireflection function and the hard-mask function of the Si-C based film.

9. A reworking method of a resist film according to claim 7 or 8, wherein

the organic solvent is a thinner.

10. A reworking method of a resist film according to claim 9, wherein

the organic solvent is an acetone-based thinner.

11. A reworking method of a resist film according to any of claims 7 to 10, wherein

the applying step is carried out by supplying the release agent onto the resist film with rotating the substrate.

12. A reworking method of a resist film according to any of claims 7 to 10, wherein

the applying step is carried out by dipping the substrate into the release agent.

13. A processing method of a substrate comprising:

a step of forming an Si-C based film and a resist film in turn on an objective film to be etched that has been formed on a substrate,

a first etching step of etching the Si-C based film making use of the resist film as a mask,

a second etching step of etching the objective film to be etched making use of the resist film and the Si-C based film as a mask, and

a peeling-off step of peeling-off the resist film at a desired timing,

wherein

the peeling-off step includes

a preparing step of preparing an organic solvent as a release agent, and

an applying step of applying the organic solvent to the resist film.

14. A processing method of a substrate according to claim 13, wherein

the Si-C based film is a film having an antireflection function and a hard-mask function, and

the applying step is carried out without deteriorating the antireflection function and the hard-mask function of the Si-C based film.

15. A processing method of a substrate according to claim 13 or 14, wherein

the organic solvent is a thinner.

16. A processing method of a substrate according to claim 15, wherein

the organic solvent is an acetone-based thinner.

17. A processing method of a substrate according to any of

claims 13 to 16, wherein

the applying step is carried out by supplying the release agent onto the resist film with rotating the substrate.

18. A processing method of a substrate according to any of claims 13 to 16, wherein

the applying step is carried out by dipping the substrate into the release agent.

19. A processing method of a substrate according to any of claims 13 to 18, wherein

after the peeling-off step, a reworking step of forming another resist film again on the Si-C based film is carried out.

20. A processing method of a substrate according to claim 19, wherein

the peeling-off step and the reworking step are carried out before the first etching step.

21. A peeling-off apparatus for peeling-off a resist film on an Si-C based film that has been formed on a substrate comprising:

a spin chuck that rotatably supports the substrate on which the resist film to be peeled off has been formed, and

a nozzle that ejects an organic solvent as a release agent toward the substrate held by the spin chuck.

22. A reworking apparatus of a resist film for peeling-off a resist film on an Si-C based film that has been formed on a substrate and for applying a next resist film comprising:

a spin chuck that rotatably supports the substrate on which the resist film to be peeled off has been formed,

an organic-solvent nozzle that ejects an organic solvent as a release agent toward the substrate held by the spin chuck, and

a resist-liquid nozzle that ejects a resist liquid toward the

substrate held by the spin chuck.

23. A reworking apparatus of a resist film comprising:

a peeling-off apparatus that peels off a resist film on an Si-C based film that has been formed on a substrate, and

a resist-applying apparatus that applies a next resist film on the Si-C based film of the substrate from which the resist film has been peeled off.